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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,373	10/10/2002	Mark A. Lillis	PES-0075	1008

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EXAMINER	
RUTHKOSKY, MARK	
ART UNIT	**PAPER NUMBER**
1745	

DATE MAILED: 09/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/065,373	LILLIS, MARK A.	
	Examiner	Art Unit	
	Mark Ruthkosky	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 July 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-16 and 21-25* is/are pending in the application.

4a) Of the above claim(s) *1-7* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-16 and 21-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 11-16 and 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andrews et al. (US 6,036,827) in view of Ono et al. (JP 401066537 A.)

The instant claims are to a process for operating an electrochemical system, comprising calibrating a hydrogen gas detector by passing a hydrogen-free gas through a first conduit to the hydrogen detector, wherein the hydrogen gas detector generates a first signal; flowing a known quantity of hydrogen gas from a hydrogen/water separator through a second conduit to the hydrogen gas detector, wherein the hydrogen gas detector generates a second signal corresponding to a percentage of the hydrogen gas in the mixture; and calibrating the hydrogen gas detector based upon the first and second signals; introducing water to an electrolysis cell; producing hydrogen; separating hydrogen from water in the hydrogen/water separator; introducing environmental gas disposed around electrochemical system components to the hydrogen gas detector; and determining the hydrogen concentration in the environmental gas.

Andrews et al. (US 6,036,827) teaches a process for operating an electrochemical system introducing water to an electrolysis cell; producing hydrogen; separating hydrogen from water in the hydrogen/water separator; introducing environmental gas disposed around electrochemical

system components to the hydrogen gas detector; and determining the hydrogen concentration in the environmental gas (see col. 7, line 30 to col. 8, line 50 and col. 21, line 50 to col. 22, line 10.) The reference teaches that if the detection of hydrogen is at a high concentration the hydrogen source would be shut down and the hydrogen and the carrier gas would dissipate into the atmosphere (col. 34, lines 1-11; col. 21, line 60 to col. 22, line 15.)

The reference does not teach calibrating a hydrogen gas detector by passing a hydrogen-free gas through a first conduit to the hydrogen detector, wherein the hydrogen gas detector generates a first signal; flowing a known quantity of hydrogen gas from a hydrogen/water separator through a second conduit to the hydrogen gas detector, wherein the hydrogen gas detector generates a second signal corresponding to a percentage of the hydrogen gas in the mixture; and calibrating the hydrogen gas detector based upon the first and second signals. The calibration of a measuring device, such as a detector, is well known in the art for providing an accurate reading by the device. It would be obvious to one of ordinary skill in the art at the time the invention was made to calibrate a detector by using known standards of samples that are to be detected in order to determine that the signal produced by the is accurate for the known standard. The detector may then be adjusted to give the proper signal if necessary. This is well known for devices such as detectors, scales, sensors and the like.

Ono et al. (JP 401066537 A) teaches a method of analyzing hydrogen in a gas including calibrating a hydrogen gas detector by passing a hydrogen-containing gas to a hydrogen detector, wherein the hydrogen gas detector generates a first signal to determine a correlationship between the concentration of hydrogen and an output signal of the hydrogen gas detector. This is followed by flowing an unknown concentration of hydrogen gas with a non-hydrogen gas

(equivalent to the hydrogen free gas mixed with hydrogen in the instant application) to the hydrogen gas detector, wherein the hydrogen gas detector generates a second signal corresponding to a percentage of the hydrogen gas in the mixture. The concentration of hydrogen is calculated by a calibration curve formula with an output signal of the hydrogen gas detector. The reference does not teach the method at applied temperatures or pressures thus, the system is considered to be at ambient environmental values.

It would be obvious to one of ordinary skill in the art at the time the invention was made to calibrate the hydrogen gas detector taught by Andrews et al. (US 6,036,827) using the method of comparing output signals based on the amount of a known concentration of hydrogen, as taught by Ono et al. (JP 401066537 A), in order to accurately detect the hydrogen concentration in an environmental gas.

The reference does not teach passing a hydrogen-free gas through a first conduit to the hydrogen detector or flowing a known quantity of hydrogen gas from a hydrogen/water separator through a second conduit to the hydrogen gas detector, however, one of ordinary skill in the art would recognize from the teachings of Andrews et al. (US 6,036,827) that a common source of a known quantity of hydrogen gas would be most available from the hydrogen generating system in order to calibrate the system as a hydrogen source as taught by Ono. Further, it would be obvious to use various known concentrations of hydrogen in order to develop a calibration curve including a hydrogen free gas. This will provide a low-end signal value for calibration. Using more points in the calibration of a detector will give a more accurate calibration of the detector over a broader range of concentrations.

With regard to claim 13, the background section of the instant specification teaches that coupling hydrogen producing electrolysis cells with fuel cells is well known in the prior art, forming regenerative fuel cells. The background further notes that calibrated hydrogen gas detectors for these systems are also well described. It would be obvious to one of ordinary skill in the art at the time the invention was made to couple the hydrogen and oxygen of the electrolyzer to a fuel cell in order to generate electricity as the coupling of the hydrogen source to a fuel cell is well known in the art to fuel a fuel cell and generate electricity.

With regard to claim 25, it would be obvious to one of ordinary skill in the art to recalibrate the hydrogen detector of Andrews in order to provide an accurate reading of the amount of hydrogen in a sample gas. Recalibrating would be obvious to the skilled artesian to reduce the possibility of error in the event that the detector drifts from its proper output. The artesian would have found the claimed invention to be obvious in light of the teachings of the references.

Response to Arguments

Applicant's arguments filed 7/25/2005 have been fully considered but they are not persuasive.

The applicant argues that the sensitivity and accuracy of hydrogen gas detectors drift over time and that the claimed method allows the hydrogen detector to be calibrated to adjust for the drift. The method comprises passing a hydrogen-free gas to a hydrogen detector that generates a first signal. The process then includes the step of flowing a known quantity of hydrogen gas to the detector that generates a second signal corresponding to a percentage of hydrogen gas in the

mixture. The detector is then calibrated based on the first and second signals. The applicant notes that the claim requires the use of both a hydrogen free gas and a known quantity of hydrogen gas, as well as two detector signals that correspond to each gas.

With regard to the Ono reference, the applicant argues that the reference teaches a reference hydrogen gas and a sample gas added to a system comprising a hydrogen detector. The reference teaches that the reference hydrogen gas is introduced to the cell to determine a correlation between the concentration of hydrogen and an output signal of the hydrogen gas detector. The concentration is calculated by a calibration curve formula with an output signal of the detector previously stored in a data processor. The applicant argues that the reference does not teach the use of both a hydrogen free gas, a known quantity of hydrogen gas and two detector signals that correspond to each gas. This is not disputed, as the reference is not used as an anticipation rejection under 35 U.S.C. 102. The rejection is based on 35 U.S.C. 103 and states that it would be obvious to calibrate the hydrogen gas detector taught by Andrews et al. (US 6,036,827) and using the method of comparing relative output signals based on the amount of a known concentration of hydrogen, as taught by Ono et al. (JP 401066537 A), in order to accurately detect the hydrogen concentration in the environmental gas (page 4, lines 3-7 and 13-15) and that it would be obvious to use various known concentrations of hydrogen in order to develop a calibration curve for the detector including a hydrogen free gas. This will provide a low-end signal value for calibration. As stated in the rejection, using more points in the calibration of a detector will give a more accurate calibration of the detector over a broader range of concentrations.

With regard to the applicant's comments to "known concentrations and other concentrations," it is noted that the reference teaches that the hydrogen detector output signal is compared with a curve that has known output signals *for known concentrations of hydrogen.* The concentrations of hydrogen and the corresponding signal must be known for various points in order to give this comparison. The examiner is not arguing that a known *detector calibration* for various points is measured in the cited reference, but the comparative output signal for *various concentrations* is taught for comparison of a measured signal to give a concentration of hydrogen gas. The reference teaches measuring a known quantity of hydrogen for calibrating the detector. However, it would be obvious to one of ordinary skill in the art at the time the invention was made to use more than one known concentration point in order to calibrate the detector signal over a broad range.

With regard to the applicant's arguments that there is no motivation to combine the teachings of the Ono with Andrews reference, this is not persuasive, as the skilled artesian would understand that the calibration of detectors is proper to ensure that the measured readings are accurate. This is standard practice in the art of measuring and is noted in Ono for giving a correlation between the hydrogen concentration and the signal of a detector. For these reasons, the claims are rejected as being obvious over the prior art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions

on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free.)

MARK RUTHKOSKY
PRIMARY EXAMINER

Mark Ruthkosky
Primary Patent Examiner
Art Unit 1745

9/27/05